

sperms frequently found in or near the opening through the spermathecal wall. Earlier in this paper, the presence of a "plug" of material in the mouth of the spermathecal duct of some callow queens was also noted. With these two exceptions, no visible substance is in this duct during the greater part of the nomadic phase. Only near the end of this phase does this condition change. In these final days, masses of sperms appear in the lumen of the spermathecal duct. These masses may be large, containing hundreds or even thousands of sperms, in some sort of unstained substance, the outer surface of which is distinct. Or the sperm masses may be small, containing not more than 100-200. Occasionally, small groups of perhaps a dozen sperms is seen. These groups are observed throughout the length of the lumen: sometimes, few in number and widely separated; sometimes, numerous and close together; seldom is there regularity in their distribution along the lumen. No queen was found with a continuous mass of sperms in the spermathecal duct. The presence of sperms in the duct is easily correlated with mature eggs in the ovarioles or in the tubes through which these eggs pass from the body.

(to be continued)

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## NOTES ON CONNECTICUT SPHAGNUM BOG

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### ABSTRACT

A small Black Spruce bog in northeastern Connecticut is described, and some Lepidoptera from it listed.

Through the kindness of Edwin Way Teale of Hampton, Conn., I was able, in July 1961, to study and collect in a small bog at West Willington, Tolland Co., Connecticut.

No more than about 300 yards long and 50 to 100 yards wide, the bog is bounded on one side by a railroad track and on the other by the fill of a large gravel pit and its lower end is cut by the Wilbur Cross Highway. The construction of the latter probably altered the bog's normal drainage system. The bog is now in a rather late stage, containing no open water or floating mat,

and fast filling in centrally with small Black Spruce (*Picea mariana*) and Tamarack (*Larix laricina*), and peripherally with Alder (*Alnus incanus*) and Red Maple (*Acer rubrum*). None of the spruce are more than 10 feet high, but the dead stubs of considerably larger ones, evidently fire-killed, are common. Small spruce are abundant. The most characteristic bog heath, Labrador Tea (*Ledum groenlandicum*) is present in two fairly flourishing patches. The other shrubs are chiefly Leatherleaf (*Chamaedaphne calyculata*), Sheep Laurel (*Kalmia angustifolia*) and various *Vaccinium* and *Gaylussaccia*. Only the Small Cranberry (*Vaccinium oxycoccus*) was found, and that not common. The substrate is thickly covered with dense billows of *Sphagnum*, and grasses and sedges are scarce, nowhere forming definite stands. The bog is, in fact, fast "closing in."

A number of Lepidoptera were collected on 12 and 18 July, some of which are particularly interesting and significant. These were:

**Lycaenidae** *Satyrium liparops strigosus* (Harris), a stray from the neighboring woodland. About 100 yards from the bog *Satyrium falacer* (Godart) and *S. caryaevorus* (McDunnough) were common, visiting *Ceanothus* flowers.  
**Hesperiidae** *Atrytone logan* (Edwards), a stray from nearby grassy meadow  
**Noctuidae** *Erastria albidula* (Guenée) and *Philometra eumelusalis* (Walker) are both common species of wet, grassy and sedgy areas and occur in many bogs but are by no means bog-limited. (Determinations by Frederick Rindge.)

**Geometridae** *Eufidonia discospilata* (Walker) is most often found in bogs, but also flies in wet meadows and open spaces (Determination by Frederick Rindge.) I have found it abundant in true bogs in Michigan and Ontario.

**Pyralididae** *Nomophila noctuella* (Schiffermueller) is cosmopolitan and abundant in all sorts of open meadows and marshes.

*Glaphyria psychicalis* (Hulst) is often common in wet, shaded woods and swamps.

*Argyria nivalis* (Drury) is common in meadows, dry to wet.

*Raphiptera argillaceëlla* (Packard) is highly characteristic of such *Picea* bogs from Labrador southward to at least New Jersey, and in Coastal Plain bogs to Florida and Mississippi. Only rarely does it stray far from bogs.

*Crambus youngellus* Kearfott (3 ♀♀ taken) is a most characteristic bog species, occurring only rarely and as a relict. Originally named from material from the large Mer Bleue bog near Ottawa, Ont., it has since been found only in a small, relict bog near Tuxedo, Orange Co., N. Y. and in bogs at Lakehurst, Ocean Co., N. J. (all captures by the writer).

*Crambus bidens* (Zeller), while not a characteristic bog species, is found around the edges of many bogs as well as in wet, more or less acid marshes; it occurs from Alaska to West Virginia, in the latter state in the edge of

a Black Spruce-Sphagnum bog in the mountains near Richwood, in Pocahontas Co.

*Crambus albellus* Clemens (abundant) and *alboclavellus* Zeller (common) are generally common in grasslands, the former particularly in wet areas, the latter in drier ones.

**Tortricidae** *Acleris minuta* (Robinson) was common, only the yellow variety being seen. Something of a Cranberry pest, this is a characteristic and widespread bog moth.

*Acleris cervinana* (Fernald), 1 specimen, (determined by N. Obraztsov), is a consistent bog moth, but also occurs in more normal swampy areas.

**Olethreutidae** *Badebecia urticana* (Hübner) occurs quite consistently in bogs, but abundantly in other open environments as well. It was common here.

**Gelechiidae** *Gelechia trialbamaculella* Chambers, 2 specimens. The identification is uncertain, awaiting revision of the group. I have this species from bog environments at Weymouth and Da Costa, Atlantic Co., N. J. but it is by no means bog-limited.

Of the above records, that of *Crambus youngellus* is the most interesting, showing the survival of a relict population of this rare species in such a very small bog. *Acleris minuta* and *Raphiptera argillaceella* are characteristic bog species, occurring more common and widely. The other species of moths are common in other open environments as well as in bogs.

Such true bogs should be located and recorded, and their biota studied, far more than is being done, since their relict populations are of special significance. Furthermore many bogs are being destroyed by encroaching civilization and all, of course, tend to disappear in the normal course of plant succession; so their study is particularly necessary. The writer would greatly appreciate being told about any bogs characterized by the presence in varying combinations of *Sphagnum*, *Ledum*, *Andromeda*, *Vaccinium macrocarpon*, and *oxycoccus*, *Kalmia polifolia*, *Sarracenia*, *Drosera*, *Pogonia*, *Menyanthes*, *Picea mariana*, *Larix*, *Chamaecyparis* and other true bog plants.